Typhoid Fever

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Typhoid Fever

- Also known as “Enteric Fever”
- Caused by *Salmonella enterica serotype typhi* (or *Salmonella typhi*)
  - a human specific pathogen
- 16 million cases/year worldwide
- 600,000 deaths/year worldwide
- Passed by fecal-oral route, and with poor sanitation or contaminated water supply

Salmonella enterica serotype typhi

- Gram negative bacilli
- Enteric fever also caused by *S. paratyphi* A and B
  - overall 7.4% cases from non-typhoidal (most in U.S.)
- Low infectious dose
  - 10^3 usually causes disease
  - volunteer studies
  - lower infectious dose with higher stomach pH due to PPI or H2 blockers

Non-typhoidal *Salmonella* infection

- Infection with non-typhoidal *Salmonella* gives a mild self-limited gastroenteritis
- Nausea, vomiting, and diarrhea within 6-48 hours of ingestion
  - stool is loose, of moderate volume, and without blood
  - rarely can be large volume and watery
- Diarrhea is self-limited, lasts for 3-7 days

Typhoid Fever-Clinical Presentation

- Febrile illness occurs 5-21 days after ingestion
- Classic presentation--FEVER and ABDOMINAL PAIN
  - Asymptomatic 7-14 days after ingestion
  - 1st week--rising, sustained fever, malaise
  - 2nd week--abdominal pain and rash (rose spots on trunk and abdomen, occurs in 5-30% of cases)
  - 3rd week--hepatosplenomegaly
- Will slowly resolve over weeks to months, or can progress to a more serious presentation

Typhoid Fever-Clinical Presentation

Typhoid Fever-Clinical Presentation

- Classic presentation not the norm however
- May have diarrhea or constipation along with non-specific symptoms prior to the onset of fever
  - chills, diaphoresis, headache, anorexia, cough, weakness, sore throat, dizziness, and muscle pain
  - 5-10% with psychosis and confusion--picking at bedclothes and imaginary objects
  - “muttering delirium”
- Exam may reveal a relative bradycardia (pulse-temperature dissociation)

Typhoid Fever-Diagnosis

- Isolate the causative organism
  - Blood culture
  - Stool culture
  - Bone marrow culture
  - culture of rose spots
  - string test of duodenal secretions
- Serologic tests may not be helpful, and just prove prior infection
  - Widal's Test--detects AB to *S. typhi* antigen
- Labs may show anemia, leukopenia, or leukocytosis
  - abnormal liver associated enzymes, but may not be as high as with other viral hepatitides

Typhoid Fever--Therapy

- Careful of resistance
- Empiric therapy for Typhoid fever
  - outside the U.S. chloramphenicol is primarily used
  - quinolones or 3rd generation cephalosporins
  - decreased susceptibility to Cipro has been reported in India and SE Asia
- Regimens
  - Ciprofloxacin 500 mg PO BID for 7-10 days
  - Ceftriaxone 2-3 gm IV QD for 7-14 days
  - Alternate is Azithromycin 1 gm PO, then 500 mg PO QD for 7-14 days

Typhoid Fever--Therapy

- For severe typhoid fever (characterized by delirium, obtundation, stupor, or coma)
  - Expert consultation
  - Steroids
    - Dexamethasone for the first 48 hours may decrease the mortality rate. Study was done on severe typhoidal fever, and with the use of chloramphenicol
    - 3 mg/kg IV first dose, then 1 mg/kg Q6 for up to 48 hours
    - steroids longer than 48 hours may increase the relapse rate
  - IV Quinolone for 10 days

Typhoid Fever--Complications

- Bowel perforation
  - usually in the third week of the illness
  - Need surgical consult for peritoneal signs
  - usually ileal perforation
- Relapse occurs 5-10%, and more so with the use of chloramphenicol
  - decreased relapse with use of quinolones

Typhoid Fever--Complications

- Chronic carrier (Typhoid Mary)
  - excretion of the organism in the stool for 12+ months
  - occurs more frequently in women with biliary abnormalities
  - 1-4% of adults with typhoid fever become carriers
  - treat with high dose Ampicillin or quinolones for up to 4 weeks
  - cholecystectomy

Typhoid Fever--Prevention

- Ensure safe drinking water, and effective sewage disposal
- Travelers should drink boiled/bottled water
  - “boil it, cook it, peel it, or fahgitaboutit”
- Wash hands!!!

- Vaccine
  - for travelers to endemic areas, household contacts of typhoid carriers, lab workers

Typhoid Fever--Prevention

- Whole cell, heat-killed or acetone-inactivated, typhoid vaccine
  - painful injection with local reaction in 25-50%
  - 65% efficacious
  - booster every 3 years
- Ty21a
  - live, attenuated oral vaccine
  - booster every 5 years
  - not for immunocompromised patients or those on ABX
  - 65% efficacy depending on the population studied

Typhoid Fever--Prevention

- Parenteral Vi based vaccine
  - booster recommended every 2 years
  - less side effects
  - knowledge of prolonged efficacy is limited, 55% over 3 years